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# User Charge Guidance Manual for Publicly-Owned Treatment Works

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# User Charge Guidance Manual for Publicly-Owned Treatment Works

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# User Charge Guidance Manual

## For Publicly-Owned Treatment Works

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# INTRODUCTION

The role of proper financial management is as important to successful operation of a publicly owned wastewater treatment utility as proper facility planning, engineering design, equipment selection or operator training. A user charge system, which is an important aspect of financial management, should be designed to assist the wastewater utility in achieving financial self-sufficiency, place the costs of pollution abatement directly on the sources of pollution (proportionately), and ensure the conservation of potable water.

A wastewater utility must develop a revenue generating system that recovers its total cost of operations. An adequate and proportional user charge system is a major factor in the development of a self-supporting utility. User charges represent, however, only one element in the total revenue strategy. The overall revenue strategy should be capable of recovering *all* of the utility's operation costs. Recouping all costs is sound financial management and essential if a wastewater utility is to become financially self-sufficient.

Congress and the Environmental Protection Agency (EPA) have recognized the significance of proper financial management and its relationship to acceptable wastewater treatment system performance. As a result, wastewater utility management must develop an EPA approved user charge system, before Federal grant assistance will be awarded for a wastewater treatment project.

The intent of this manual is to assist wastewater treatment works managers—particularly financial planners, rate designers, and engineers—of small and medium sized communities, regardless of Federal grant assistance, in understanding the various procedures needed to develop a user charge system and other cost recovery concepts.

Information presented in this manual provides typical work steps and concepts for developing and implementing a user charge system as well as developing a strategy for recovering other operating costs. This material addresses: the types of personnel (project team) needed to develop and operate a user charge system; organizational structure and support functions; rate setting methodology; user charge ordinances; overall revenue recovery and EPA regulations concerning user charge systems.

The reader should be aware that EPA regulations have certain constraints and/or prohibitions that either modify or limit the range of activities available to wastewater treatment works managers in the development of a user charge system. These regulations must be followed in order to receive a construction grant.

This document offers guidelines for the development of user charge systems. Since each system must be tailored to reflect the unique conditions of the treatment system it will support, the make-up of the project team, customer data, rate structure, ordinances, etc., will most likely vary from the examples in this manual. Please note, this document is designed to supplement the Interim Final (May 12, 1982) and Final (February 17, 1984) Construction Grants Regulations.

# ORGANIZE THE PROJECT TEAM

Developing and implementing a successful user charge system requires the expertise of professionals in several different areas. In most instances assistance from financial, legal, engineering, planning, and administrative personnel will be necessary.

A wastewater treatment utility needs financial personnel who have a good working knowledge of the theory and practice of public enterprise fund accounting. Financial personnel will be required to: estimate operation, maintenance and replacement costs (O,M&R); evaluate the economic impact of user charges upon various users or user categories, develop a proportionate user charge system and preliminary rate estimates; forecast the degree of change required to modify existing budgeting, billing and accounting functions to accommodate a user charge system; determine annually if user charges should be revised and, with regard to the capital financing of the facility, recommend the type of bonding mechanism which best suits the system's financial capability.

In addition to financial assistance, a wastewater treatment utility needs legal personnel to identify interjurisdictional relationships affecting a user charge system and prepare the appropriate intermunicipal service agreements. Legal services are also required to assure that the proper inter-relationship exists between the user charge ordinance, sewer use ordinance, and the pretreatment program (if required).

Engineering expertise is needed by a wastewater utility to: define unit processes and process loads; and establish a method of reconciling total plant loadings with the results of user samplings.

The project team should also include planning personnel. Their responsibility will be to forecast new development trends, demographic trends and areas targeted for growth. They must be able to identify new industries which could have an impact on waste loadings.

In order to successfully implement a user charge system sufficient administrative support staff should be available and have the capability to: compile and maintain customer records, perform customer service functions and handle user inquiries; and provide other administrative services associated with developing and implementing a user charge system.

If sufficient financial, legal, engineering, planning or administrative personnel are not employed by a wastewater treatment enterprise, management may want to consider contracting with the appropriate consultants.

Before soliciting consulting services, management should determine: what needs cannot be met by existing staff; specific accomplishments to be achieved; the type of consultants to be hired; and what level of expertise is required.

Coordinating the activity of the project team is the responsibility of the chief administrative officer (public works director, superintendent, etc.) He or she must be involved in the development of a user charge system to provide the overall direction and organization for achieving operating goals, objectives, and policies.

# ORGANIZATIONAL STRUCTURE AND SUPPORT FUNCTIONS

The overall organizational structure of a wastewater treatment utility and the support functions it provides affects not only the type and way services are provided, but also the development of the user charge system. In order to develop a self-supporting utility in concert with a proportionate user charge system, management must carefully analyze its organizational structure and support functions.

**Organizational Structure**

The wastewater utility's structure will reflect its political, financial and operational environment. There are a broad range of possible structures, however, most are variations or combinations of the following:

*As a municipal department,* the utility usually exists as a department within the local government. The financial structure is generally integrated into the general municipal account; and the budget is usually part of the general municipal budget. Usually, the municipal department structure provides elected officials with complete control of the utility. The key financial issues for a municipal department are raising capital and operating revenue. If the municipal budget is financially strong, the department can obtain less expensive capital, i.e., general obligation or revenue bonds. As a department within a local government, the utility has the capability of being able to draw on the general fund when unexpected shortfalls occur. This type of borrowing capability, however, does not encourage self-sufficiency.

Additionally, when a utility is operated as a municipal department, its support functions (indirect costs), e.g., accounting, budgeting, data processing, purchasing, etc., are generally performed by other municipal departments. For small utilities, having these functions performed by other departments is beneficial, since the utility could not afford to maintain the same level of service by itself and it avoids unnecessary duplication of activities. For larger utilities, however, this type of support is frequently inadequate to serve the utility's needs. In any case, not charging indirect costs to the utility gives a false impression that it is self-supporting when in fact the general government and the entire tax base are supporting the operation.

*As an enterprise system,* the wastewater utility is operated as a business by the general purpose local government which owns and manages the system. A utility can be operated as an enterprise if it is entirely self-supporting. To be self supporting, a utility must establish a system of fees and charges that generates sufficient revenues to pay for all operating costs, including the replacement of equipment, and debt retirement. The financial aspects of the system are separate from that of the general governmental operations, and the enterprise fund is maintained independently to account for the assets, liabilities, and fund equity of the system, as well as its revenue flow, operations, and non-operating expenses. Capital financing may be obtained through either general obligation or revenue bonds. Repayment will usually come from user fee revenues. General purpose governments, which operate a utility as an enterprise, usually reserve general obligation debt capacity for non-revenue generating facilities so that general revenues or taxes can be used to repay such debt.

A wastewater enterprise utility may need to "purchase" support services from the general government unless it is large enough to support full-time administrative and financial personnel. However, these indirect costs are reflected in the accounting for the enterprise fund and appropriate reimbursements, are made to the general fund for services rendered. If an enteprise fund experiences a deficit, it may borrow available revenues by means of inter-fund transfers, but this represents a liability and must be repaid.

While large municipal system owners usually maintain utilities as enterprises, small cities and towns can also successfully use this approach if the self-supporting concept is applied. The advantage of this approach is that the financial integrity of the utility system can be upheld without depending on general government support. In either case, the local government retains management control and rate-setting powers.

*As a municipal authority,* the municipality retains ownership of the utility while most management control is vested in the authority. The authority (board or commission) is appointed by the local elected officials. Terms of office are generally overlapping. Financial and accounting systems are completely separate from the municipality's. The authority is generally vested with the power to establish its own budgets and set utility rates without municipal approval. The authority may also be empowered to issue bonds, although voter or elected official approval may be required. The major advantage of this type of structure is its operational autonomy. This autonomy provides insulation from political pressure concerning budgets and rates.

*As an independent authority,* or special service district, the utility is usually created by a special act of the State legislature which defines how the authority is to be structured and operated. A board or commission arrangement is the typical governing structure which can be amended only by State legislation. Through creation of such an authority, a municipality can shift the burden of a substantial service to an essentially separate jurisdiction. Ownership of the utility rests with the authority.

The degree of control a municipality can maintain over an independent authority depends on the enabling legislation. Control over appointments to the governing board, its composition, terms of office, and the use of surplus revenues are all mechanisms which a municipality can use to hold the independent authority accountable to municipal interests. In practice, however, a satisfactory balance between independence and accountability is difficult to achieve.

*As a regional treatment authority,* the utility may be created by either a contract between several political subdivisions (subscribers) or by a special act of the State legislature. The governing board or commission is either appointed by the subscribers or elected by popular vote. The major advantage of a regional authority is that it can achieve a greater economy of scale when compared to the individual wastewater operations of subscribers.

If the regional agency is authorized to bill the individual users within the system, only one revenue program and rate ordinance is required. If the regional agency bills the subscribing agencies, which in turn bills the individual users, separate revenue programs are required for the regional and each subscribing agency. Each subscribing agency must also adopt its own rate ordinance based on the approved revenue program. (The enabling legislation or contract specifies the degree of financial and operational autonomy enjoyed by the authority.)

In conclusion, there is no "best" organizational structure. While structure is important, it is only one of several factors that determines successful utility operation. There are financially and managerially strong systems under each organizational alternative. Experience, however, suggests that the more financially capable a utility is in meeting its short-term (operating) and long-term (capital) requirements, the less the need, from a financial perspective, for revising the organizational structure.

## Support Functions

Regardless of which institutional structure is established certain support functions must be provided.

### Engineering and Operating Data Collections

A wastewater treatment utility consists of a number of working systems (unit processes) that must be operated and maintained. These unit processes include the collection system, preliminary treatment (grit removal and screening) primary treatment, secondary treatment, solids handling, and disinfection. Each unit process is designed to deal with one or more of the main characteristics of normal domestic sanitary sewage, i.e. volume (flow) and loadings (biochemical oxygen demand (BOD) and suspended solids (SS). For example, the collection system is designed to accommodate a specific volume of wastewater; screening and grit removal are designed to reduce suspended solids; and primary treatment is designed to reduce both BOD and SS.

Identifying these unit processes and their purpose in terms of flow, BOD, and SS requires accurate operating data and engineering judgment. This procedure should be performed early in the user charge system development process and when plant improvements or additions are made.

The allocation of operating data to the unit processes is also essential to the establishment of an equitable user charge system. Labor (hours), chemicals, supplies, equipment replacement, the operating time of motors, and power requirements must be allocated among the various unit processes. The information to develop these allocations can usually be obtained from time and material distribution sheets for the utility.

Once unit processes have been identified and operating data allocated, OM&R costs can be distributed.

The next step involves the establishment of sampling programs at certain key locations in the sewerage system and at discharge points of major users. This allows utility management to adequately identify users based on their wastewater characteristics (flow and loadings). The flow and loadings information (BOD, SS or other appropriate constituents) obtained from the sampling program will be used in calculating proportional user costs.

**Budgeting Procedures**

Management should first define what constitutes a capital expense and what items constitute operation, maintenance and replacement (O&MR) expenses. (Replacement costs include such items as: pumps, motors, motor vehicles, blowers, etc.)

Capital outlays are normally included in the capital program: a budget which involves development of short- and long-term plans to refurbish and expand the utility's physical facilities. This includes planned expenditures for improvements and betterments to buildings, land, sewers and major pieces of equipment which have significant value and extend the useful life of the treatment works.

The current expense (operating) budget includes those items considered to be routine operation, maintenance, and replacement expenses. The operating budget generally involves development of a one-year action plan for the day-to-day operations of the treatment works. This budget can include planned expenditures for salaries, supplies, chemicals, normal maintenance expenses, and outlay for new or replacement equipment. (See Appendix I for examples of typical operating budget items.)

The budget should identify O,M&R costs in total and by unit processes (i.e., collection system, primary treatment, secondary treatment, etc.). To accomplish this requires that total OM&R costs be allocated in accordance with the operating and engineering data discussed above. (See Appendix II).

Once unit process costs have been established, the next step is to divide these costs by the total annual volume and/or loadings, as appropriate, to produce unit costs. Unit costs are then multiplied by the flow and loadings of the user classes to establish an annual rate in proportion to the demand on the wastewater utility.

**Accounting Systems**

Wastewater utilities should establish an accounting system that reflects the budget system and conforms to generally accepted accounting principles. Installing such a system requires establishing the books of account, formulating a plan for gathering information, determining the number and type of accounts, records, and documents, and establishing billing and collection procedures.

The revenue structure of the accounting system should list revenues by user classes, compare actual receipts to estimates and include amounts billed but not yet received.

The cost structure of an accounting system should allow management to separate capital expenses from O,M&R expenses and include a formal encumbrance system so management can determine assets and outstanding liabilities in addition to the account balance. The cost structure should also reflect the operating budget of the wastewater utility and its unit processes. The accounting system should permit reports to be developed which compare approved budget figures (appropriations) to actual expenses.

In many instances enterprise fund accounting is used to account for wastewater operations where there is a significant potential for financing the utility's costs through service charges or where the utility desires to know its profit or loss. An enterprise fund is designed to gather total costs and to indicate the extent to which service charges are sufficient to recover total costs.

The typical objectives of an accounting system include: recording revenues receipts and billings by individual user and user class; reporting O,M&R costs in total, and unit process; recording and reporting on billing and collection activities; and determining changes in assets, liabilities, and fund balances.

### Customer Recordkeeping System

This may involve the collection of information such as: name; address; lot/block number; connections data; tax assessed values (for ad valorem only); user classification; and water meter records (where water consumption is used as basis for sewerage billing).

Customer records should also be used to store usage data for each customer. These records would be updated periodically based upon reports furnished by operations personnel.

Providing timely and adequate responses to inquiries and appeals from users is also an important recordkeeping function. This is normally handled by a utility's customer service department. Customer service activities include: documenting; investigating; and preparing replies for all inquiries and appeals. Management should make certain that appeal procedures are adequately addressed in the user charge ordinance.

### Manual Versus Automated Information System

As wastewater utilities become increasingly more complex to operate and manage, information systems are becoming more important to successful operations. The decision to have a manual or automated budget and accounting information system is influenced by several factors: the size and nature of the utility; the costs of operating an automated or manual user charge system, the volume and transactions which must be processed to support the system; and the need and frequency of general management reports.

### Public Involvement

Throughout the process of establishing a user charge system, management should develop a program to keep the public well-informed. During the past several years, proposed sewer rate increases have met with increasing public resistance. Citizens who are convinced about the importance of an adequately financed wastewater system can be a positive force in mitigating public reaction to rate increases. However, if rates are found to be excessive, then citizens can provide suggestions for alternative action. Overall, citizen involvement will enhance public awareness and acceptance of the user charge system. A successful public involvement program will normally contain: public hearings; workshops; advisory groups; speaking engagements; and media coverage.

# RATE SETTING METHODOLOGY

Any community served by a wastewater treatment utility is in a constant state of change. As new developments for residential and industrial users are planned and constructed, wastewater volume and strength characteristics will fluctuate. Selecting a rate-setting model normally involves conducting a review to determine the number and types of users contributing to the utility, their discharge characteristics, and the treatment plant's processing capability.

When developing a user charge system, management must determine: 1) who will be billed; 2) what factors billing will be based upon; and 3) how the billing will be performed.

**Determine Who Shall Be Billed for Service**

Wastewater utility managers must be able to identify *all* users so they can be billed in accordance with user charge regulations. This entails identifying who presently receives, but is not being billed for, wastewater treatment services. Tax-exempt, not-for-profit organizations, etc. will probably be billed for the first time. Depending upon a wastewater utility's ability to determine which users are currently being billed for treatment services, managers may have to devote significant effort: to identifying all users of the utility; to characterize their wastes; and to determine the process loads contributed to the facility.

Once all users have been identified, the next step is the establishment of user classes. User classes may vary from a single class of users to multiple classes of users. The classes should be developed on the basis of the types and/or activities of the users. Generally speaking, most utilities have a minimum of four user classes: (1) residential, (2) commercial, (3) industrial, and (4) governmental/institutional. Each utility should carefully review its own customer base to determine the appropriate classifications.

**Determine What The Billing Shall Be Based Upon**

One of four methods can be used to establish proportionate user charge rates. Presented below, in order of simplicity, is a description of each method.

**Equivalent Dwelling Unit Rate**-This method is typically used when metering is not available and the volume and strength of *all* users' discharges are relatively equal. This approach is usually employed by communities of 3,000 population or less. A uniform rate is assessed on all users, based on the discharge volume and strength of the predominant user class, i.e., generally residential. Increments of the rate are assessed on large commercial and industrial users based upon number of employees, fixture units, or some other appropriate factor that equates the flow and strength from non-residential users to that of residential users.

**Volume**-This method is used when unit processes are primarily dependent on volume (flow) and when the discharge strength of all users is substantially equal and approximates the strength of domestic discharge. It would be most appropriate where the users of a wastewater utility are primarily residential and there are no industrial users whose discharge strength significantly exceeds that of domestic sanitary sewage. Individual wastewater flows must be measured or may be based on metered water usage.

**Surcharge** - This method normally would be appropriate where some users have high strength discharges while a majority of users have discharges equivalent in strength to normal domestic sanitary sewage. The surcharge model is based on two charges. The basic charge involves establishing a volume rate which is applied to the discharge volumes of all users. The second charge, called a *surcharge*, should be determined and charged to those users whose discharge strength exceeds that of normal domestic sanitary sewage. The surcharge requires a calculation of a rate for each strength-related billing parameter.

**Quality/Quantity** - This method requires determining unit costs for volume and strength (i.e., Suspended Solids and Biochemical Oxygen Demand and/or other appropriate parameters) and application of these unit costs to the quantity and quality of discharge from each user (user class) to determine user fees. The quality/quantity rate structure would be suitable for a facility (utility) where there are a sizeable number of users with different wastewater characteristics in terms of the type and concentration of the discharge. Discharges must be periodically monitored and analyzed to determine strength characteristics.

The quality/quantity method should not be used when there are less than normal strength dischargers. Since weak strength wastes are more expensive to treat than normal domestic sewage (because the plant is designed to function within a specific range of concentrations), charging weak strength users rates based on normal domestic strength sanitary sewage will result in a shortfall.

Determing the appropriate rate-setting model represents a key step which must be accomplished in the planning stage of the user charge development process. Management should be aware that the volume based model is often appropriate for facilities such as lagoons or in situations where all users contribute discharges of approximately equivalent strengths. A volume based model will generally not be adequate when the facilities serve: (1) users (or user classes) who contribute discharges of significantly higher strength than normal domestic sanitary sewage, or (2) users whose discharges contain additional pollutants such as chromium, zinc, cadmium, lead, oil or grease, etc.

When selecting the proper rate-setting model, management should also consider the anticipated strength, volume and flow rate characteristics of future users. Although a volume based model may be adequate for current users, developing rates at the outset using the surcharge or quality/quantity models may facilitate management's ability to maintain proportionality for future users without revising their rate-setting methodology.

Regardless of which rate-setting model is selected, the utility should incorporate the concept of a *minimum charge* as a means of recovering certain fixed costs that continue to occur whether the utility operates or not. These include certain kinds of insurance, payments due under certain contracts, and, in some cases, all or a certain portion of the administrative overhead. These costs must be recovered. The mechanism used for recovery is the minimum charge. The charge is based upon a pre-determined minimum flow and strength loading; and, unless usage exceeds these parameters, the user pays the minimum charge.

**Determine How The Billing Shall Be Performed**

Billing for O,M&R costs may be achieved through the actual use or ad valorem tax methods:

**Actual Use** - A system of charges whereby O,M&R costs are apportioned to the users (or user classes) according to their *actual use* (measured flow and/or strength parameters) of the wastewater utility. This method involves generation of separate invoices to directly assess each user for services received.

**Ad Valorem Taxes** - A system of charges whereby O,M&R costs are allocated to users based upon *tax* assessed *values* of the property. Since property values are the basis of the billing, no relationship is established between usage and cost. Other negative factors concerning the ad valorem method are that it does not promote water conservation and, because it is based on property values, the thrifty water user actually subsidizes the extravagant user. For these reasons, the ad valorem method is not widely used-nor recommended-as a basis for billing. If federal construction grant funds are involved, please refer to the Chapter entitled: "User Charge Regulatory Requirements" for a discussion of the restrictions on the use of an ad valorem system.

# DEVELOPING A USER CHARGE ORDINANCE

In most cases a user charge ordinance will have to be developed and approved by local government officials before a user charge system can be implemented. Each ordinance will have to address specific issues unique to a locality and be considered through the local political process.

When wastewater utilities, serving more than one municipality, are consolidated into a regional system the "combined" revenue program must cover all wastewater treatment services that are provided by the regional system. Each participating agency must adopt its own user charge system rate ordinance which will generate a proportionate share of the "combined" revenue of the regional system.

A well constructed ordinance will: explain why user charges are collected; give complete definitions of terminology; detail how user charge revenues are utilized; explain the rate structure including the criteria on which billings are based, actual rates and how often users are billed; specify penalties for late payments and non-payment; define the user's responsibilities for reporting their wastewater characteristics; outline appeal procedures for users who question their rates; and define the municipality's responsibilities for informing users about rate changes. Also, the structure of the ordinance should be such that rates and charges, which are subject to annual revision, can be easily changed without affecting the other contents of the ordinance.

A model ordinance (Appendix III) and methodology for developing rates (Appendix III A) are presented in this manual to serve as a guide for developing an appropriate user charge ordinance. Since each local ordinance must be tailored to reflect the unique conditions of the treatment system it will support, the make-up of the ordinance will most likely vary from the model in this manual.

# OVERALL REVENUE STRATEGY FOR TOTAL OPERATING COST RECOVERY

User Charges represent only one element in a total revenue strategy. The overall revenue strategy should be capable of recovering *all* of the wastewater utility's essential operating costs. The chapter on rate-setting methodology outlined the concepts for developing a proportionate user charge system for recovering the O,M&R costs associated with the levels of service provided. There are numerous approaches to offsetting costs (other than O,M&R costs) which will allow management to generate sufficient revenues to support self-sustaining operations, while remaining responsive to the economic and related concerns of the communities they serve. While it would not be practical to address all of the methods which management might use to recover their total annual revenue requirements, this section outlines approaches for determining annual revenue requirements and methods for generating sufficient revenues to meet the annual revenue requirements.

**Approaches To Determining Annual Revenue Requirements**

Depending on State regulations, a wastewater utility's revenue requirements may be determined on either the "cash basis" or the "rate-return basis." In this context, the term "cash basis" is used to describe a methodology for determining annual revenue requirements and does not relate to the accounting method. The cash basis method of revenue requirement determination is generally used by municipally-owned utilities *not* subject to rate regulations by a State public utilities commission or its equivalent. Wastewater utilities which are subject to such rate regulations will generally be required to use the "rate-return basis" for determining their revenue requirements.

Determining revenues on the cash basis generally has the advantage of providing for cash needs on a more realistic basis. Publicly owned wastewater treatment utilities are generally financed by issuing bonds, and the associated debt service costs must be met from annual revenues. Therefore, the cash basis method, which includes debt service costs as opposed to depreciation as a revenue requirement, is typically more attuned to the needs of publicly owned wastewater utilities. In addition, the goal of a publicly owned wastewater utility is to recover its costs, not to make a profit. Revenues determined on the cash basis would include O,M&R expenses, capital outlays for major rehabilitations, expansions or upgrades, and debt service requirements. Depending upon the specific needs of individual public wastewater utilities there are other optional items, such as the establishment of various reserve funds, which may be included.

The "rate-return basis" method is premised on the determination of revenue levels that provide a given rate of return on a defined investment. This method requires the determination of a revenue level which is sufficient to cover annual operating requirements, depreciation, and provide the desired rate of return.

Regardless of which basis is used, the key concepts which management should keep in mind include:

Costs required to achieve and maintain compliance with discharge permits, and to protect the wastewater utility's future financial viability, *must* be included in the annual revenue requirements;

Local needs, resources and constraints should be given careful consideration when determining other costs included in the annual revenue requirements;

Financing strategies will impact the revenue requirements for any given year and should be carefully analyzed in terms of their short and long term advantages and disadvantages.

**Methods Of Generating Sufficient Revenues To Meet The Annual Revenue Requirements**

The type of rate structure used to recover O,M&R costs should be consistent with the wastewater utility's cost of service characteristics and local goals and objectives. For recovering costs other than O,M&R, management generally has considerable flexibility in selecting cost recovery methods which best suit their unique circumstances. Three basic types of revenue generation (or cost recovery) methods which are typically used to recover "other costs" are: special assessments; secondary revenue offsets; and other service charges.

*Special assessments* may be used to recover capital costs for proposed wastewater treatment facilities (including collection systems) which will benefit property owners within a carefully defined area or will serve a unique propose. A special assessment amount is assessed against and collected from each property according to benefit. Property owners are generally given the option of paying the entire assessment initially or paying it in installments at a specific interest rate. Examples of costs which might be recovered through special assessments would include: the costs to install sewer connector lines for a new development (benefits specific users); and the costs of establishing dedicated funds for future development or contingencies (serves a unique purpose).

Where carefully defined benefits can be demonstrated, assessment bonds may be used to provide financing. Although this type of financing has not been used extensively in the past, management may want to consider this financing vehicle and should be aware that it may be used more frequently as wastewater utilities and other public agencies look for new ways to raise capital.

*Secondary revenue offsets* are generated by a wastewater utility from activities other than the provision of wastewater treatment services. Secondary revenues would include: interest income; fines and penalties; indirect cost reimbursement proceeds; equipment sales or disposal; sales of excess capacity and by-products such as sludge, processed wastewater, excess oxygen or power generation capacity, and other types of credits. Recognizing that revenues such as those just described provide a significant opportunity to reduce the economic impact of rising treatment costs, managers should make certain that efforts are made to maximize these revenues.

*Other service charges* may be used to recover the remaining non-O,M&R costs for which the user charge rate structure is not appropriate. Such costs might include: late payment penalties; septage treatment costs; connection costs (i.e. turn on/turn off); and other costs of general management and administrative activities not directly associated with O,M&R.

In selecting the individual type of service charge to be used (i. e., a general service charge to all users or a specific service charge for services which benefit only specific users) management should consider the nature of the costs to be recovered and any unique local considerations which may exist.

# USER CHARGE REGULATORY REQUIREMENTS

This chapter is intended to assist the reader in understanding the user charge requirements as a starting point for timely development and approval of user charge systems. To accomplish this objective, the chapter is organized into the following sections:

—Impacts of Public Law 92-500 (Federal Water Pollution Control Act Amendments of 1972) and Public Law 95-217 (Clean Water Act of 1977)

—Key User Charge Compliance Requirements

—Penalties of Noncompliance

**Impacts of Public Laws 92-500 and 95-217**

Section 201 of the Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500, provided the authority by which certain municipalities within each state could obtain Federal grant funding for the construction of sewage collection, treatment, and disposal facilities. As a stipulation to receiving these Federal grants, Section 204 (b) of this Act requires that each grantee develop an approved system of user charges whch, among other requirements, must accomplish the following:

1. Ensure that recipients of wastewater treatment services pay their *proportionate* share of O,M&R costs based on the quantity and quality of their discharges. From a regulatory perspective these costs are defined as follows:

   Definition of O,M&R Costs

   **Operation and Maintenance** - Expenditures incurred during the useful life of the treatment works for materials, labor, utilities and other items which are necessary for managing and maintaining the facility in order to achieve the capacity and performance for which it was designed and constructed. The term "operation and maintenance," when used in the regulations, includes replacement as defined below.

   **Replacement** - Expenditures incurred for obtaining and installing equipment, accessories, or appurtenances during the useful life of the treatment works necessary to maintain the capacity and performance for which the facility was designed and constructed. This definition of replacement does not include expenditures for major rehabilitation or reconstruction upon expiration of the useful life of the treatment works.

2. Generate sufficient revenues to provide for the proper operation, maintenance and replacement of the treatment works.

3. Ensure that municipalities receiving wastewater treatment service *adopt* the user charge system and pass through proportionate charges to the end user. The user charge systems adopted by individual participating municipalities may differ from that of the grantee as long as the charges to the end users are proportionate and the systems comply with the user charge regulations.

Public Law 95-217, adopted in 1977, amended Public Law 92-500 in several ways. The major changes applicable to the development of user charge systems are summarized below:

1. Ad valorem taxes may be used to collect all or part of the user charges. Municipalities electing to use this method must ensure that the portion of ad valorem taxes related to wastewater treatment (O,M&R costs) are separately identified to the taxpayer each year; the budgeting and accounting procedures must ensure that a specified portion of the tax funds will be used for the payment of O,M&R costs; and industrial users must be billed on the basis of actual usage. Additionally, this tax structure must have been in effect on or before December 27, 1977, and dedicated for the purpose of wastewater treatment—specifically O,M&R,—if it is to be the basis of the user charge system.

2. Grantees must recover the pretreatment program costs through the user charge system or from some other identified source of funds as well as placing incremental costs resulting from toxic discharges and contaminating or inhibiting sludge disposal on the user responsible for such discharges.

**Key User Charge Requirements**

Public laws 92-500 and 92-217 require the EPA to develop, as part of the Construction Grants Program, specified regulations regarding the implementation of user charge systems. In response to this legislative requirement EPA promulgated Title 40 of the Code of Federal Regulations (CFR).

There are several parts of the code that have an effect on the preparation and implementation of user charge systems: Part 25 Public Participation in the Program under the Clean Water Act; and Part 35 Subpart I Grant for Construction of Treatment Works.

For a thorough understanding of the user charge requirements, managers are urged to obtain a copy of Title 40 of the Code of Federal Regulations.

The following two exhibits[1] summarize the key user charge requirements and their respective regulatory citations.

[1]The regulatory citations for Part 35 refer to the interim final (May 12, 1982) and final (February 17, 1984) Construction Grants Regulations.

# KEY USER CHARGE REGULATORY REQUIREMENTS AS A CONDITION OF RECEIVING A CONSTRUCTION GRANT

| REGULATORY REQUIREMENTS | REGULATORY CITATION 40 CFR PART: |
|---|---|
| 1. Prepare the framework for approval of a user a user charge system by: | |
| —Insuring adequate public participation | 25 |
| —Including a cost-effective analysis of the annual capital and O,M&R costs of the various treatment techniques techniques considered in the facilities plan | 35.2030 (b) (3) (vii) |
| —Including the cost impacts on system users of the technology selected | 35.2030 (b) (7) (iii)* |
| —Demonstrating the legal, institutional, managerial, and financial capability to ensure adequate O,M&R | 35.2104 (b) |
| —Developing a plan of operation that addresses the user charge system | 35.2106 |
| —Executing the proper intermunicipal service agreements, when necessary | 35.2107 |
| 2. Develop User Charge System which provides for the following: | |
| —Distributes O,M&R costs for wastewater treatment to users (or user classes in proportion to the total loading of each user (or user class) | 35.2140<br>Section 204 (b) (1) (A) of the Act |
| —Generates sufficient revenue to offset O,M&R costs | 35.2140 (a) (b) |
| —Establishes user classes as required | 35.2140 (a) (b) |
| —Distributes Infiltration/Inflow costs among all users | 35.2140 (e) |
| —Annual notification of users | 35.2140 (c) |
| —Establishes financial management system to account for revenues and expenditures | 35.2140 (d) |
| —Ensures that toxic dischargers pay for the incremental costs of treatment and sludge disposal | Section 301 of the Act |
| —Ensures that user charge system takes precedence over agreements or contracts between the grantee and users | 35.2140 (g)** |

*Changed to 35.2030 (b) (8) (iv) in the Final Construction Grants Regulations published February 17, 1984

**Changed to 35.2140 (h) in the Final Construction Grants Regulations published February 17, 1984

| | | |
|---|---|---|
| 3. | **Secure user charge system approval from EPA or delegated state** | |
| | —Actual use | 35.2140 (a) |
| | —Ad valorem taxes. This tax structure must have been in effect on or before Dec. 27, 1977 if it is to be the base of a user charge system | 35.2140 (b) |
| 4. | **Ensure that municipalities receiving wastewater treatment services approve the user charge system** | 35.2140 (f)*** |
| 5. | **Develop user charge ordinance** | 35.2140 (f)*** |
| 6. | **Secure user charge system approval** | 35.2122 |

# KEY USER CHARGE REGULATORY REQUIREMENTS AFTER CONSTRUCTION GRANT IS AWARDED

| | REGULATORY REQUIREMENTS | REGULATORY CITATION 40 CFR PART: |
|---|---|---|
| 1. | **Ensure that municipalities receiving wastewater treatment services adopt a user charge system and incorporate it in municipal legislative enactments or other appropriate authority.** | 35.2140 (f)*** |
| 2. | **Ensure that user charge system is implemented when wastewater treatment facility becomes operational.** | 35.2208 |
| 3. | **Notify users annually regarding the following:** | |
| | —user charge rates | 35.2140 (c) |
| | —portion of ad valorem taxes related to wastewater treatment services. | 35.2140 (c) |

**Penalties of Noncompliance**

The Construction Grants Program regulations are very specific as to when in the grant process the grantee is to have a user charge system developed and approved. The grantee should be aware of the general noncompliance provisions contained in 40 CFR and 30.900, General Regulations for Programs, which include: termination/annulment of the grant; disallowance of project costs; withholding of grant funds; suspension of project work; and institution of other actions.

***Changed to 35.2140 (g) in the Final Construction Grants Regulations published February 17, 1984**

## APPENDIX I

## TYPICAL OPERATING BUDGET LINE ITEMS

**Salaries and Wages:**
- Full-time
- Part time
- Per diem

**Indirect Salary and Wage Costs:**
- F.I.C.A.
- Health Insurance
- Retirement
- Workmen's Compensation
- Unemployment Insurance
- Other Costs (vacations, sick leave, etc.)

**Contractual Services**
- Legal
- Engineering
- Financial (Audit)
- Insurance
- Printing
- Other

**Materials and Supplies**
- Chemicals—floculation
- Chemicals—disinfection
- Chemicals—other
- Motor vehicle fuel and lubricants
- Laboratory supplies
- Tools under $100.00
- Office supplies
- Cleaning supplies

**Utilities**
- Power—electrical fuel requirements for treatment works processing and plumbing
- Power—electrical and fuel requirements for buildings and administrative offices
- Telephone
- Gas
- Water
- Other

**Equipment Replacement**
- Tools over $100.00
- Laboratory equipment
- Motor vehicles
- Mowing equipment
- Office equipment
- Pumps with a value over $100.00
- Motors with a value over $100.00
- Other

Note: These line items would apply, as appropriate, to treatment operations, sewer system maintenance, billing, and other administrative functions.

## APPENDIX II

### SAMPLER USER CHARGE RATE CALCULATIONS FOR O,M&R COSTS

KEY ASSUMPTIONS

The assumptions included in this section are representative of a 5-10 mgd activated sludge plant which provides secondary wastewater treatment to its users. Presented below are six tables outlining the key assumptions which have been developed for purposes of illustrating the User Charge rate calculations provided in subsequent pages. The tables are:

**Table 1**: Identifies the total O,M&R costs of the wastewater treatment plant and allocates those costs by volume, Biochemical Oxygen Demand, and Suspended Solids.

**Table 2**: Identified selected annual operating statistics needed to calculate excess BOD and SS.

**Table 3**: Establishes Number of Equivalent Dwelling Units where measured flow statistics are not available.

**Table 4**: Calculation of Normal Domestic Sanitary Sewage Loadings.

**Table 5**: Excess Amount of BOD and SS.

**Table 6**: Percentage of Normal Loadings to Actual Loadings.

Tables 1 and 2 are used in all the sample calculations. Table 3 is applicable to The Volume Method using Equivalent Dwelling Units. Tables 4,5, and 6 are used to develop The Surcharge Method.

The following abbreviations are used in this appendix:

| | |
|---|---|
| BOD | -Biochemical oxygen demand |
| mg | -Million gallons |
| mgd | -Million gallons per day |
| mg/L | -Milligrams per liter |
| O,M&R | -Operation, maintenance and replacement costs |
| SS | -Suspended solids |

**TABLE 1** ALLOCATION OF TOTAL ANNUAL O,M&R COSTS BY UNITS PROCESS

| Unit Process | Total Annual Costs | Volume | | BOD | | SS | |
|---|---|---|---|---|---|---|---|
| | | Percent | Amount | Percent | Amount | Percent | Amount |
| Collection system | $ 239,000 | 100% | $239,000 | — | — | — | — |
| Grit and screen | 26,000 | — | — | — | — | 100% | $ 26,000 |
| Primary clarifier | 55,000 | 80 | 44,000 | — | — | 20 | 11,000 |
| Aeration and Secondary clarifier | 316,000 | — | — | 100% | $316,000 | — | — |
| Chlorination | 17,000 | 100 | 17,000 | — | — | — | — |
| Solids disposal system | 390,000 | — | — | 50 | 195,000 | 50 | 195,000 |
| Plant Water Supply | 17,000 | 100 | 17,000 | — | — | — | — |
| General plant services | 188,000 | | | | | | |
| Administration | 219,000 | | | | | | |
| Reserve equipment replacement | 180,000 | | | | | | |
| Subtotal | $1,647,000 | | $317,000 | | $511,000 | | $232,000 |
| Allocation of general costs* | | | 121,700 | | 196,200 | | 89,000 |
| Allocation of equipment replacement reserves** | | | 53,800 | | 86,800 | | 39,500 |
| Total O,M&R costs | $1,647,000 | | $492,500 | | $794,000 | | $360,500 |

*The general costs (General Plant Services, Administration) have been allocated to the unit processess in the same proportion as were O,M&R costs.
**Reserves for equipment replacement have been allocated on the basis of prior year's cost experience.

**TABLE 2** SELECTED ANNUAL OPERATING STATISTICS (Based on Plant Records)

| | | |
|---|---|---|
| **Volume** | = | 2,993 mg |
| **BOD** | = | 7,600,000 lbs |
| **SS** | = | 8,000,000 lbs |

**TABLE 3** EQUIVALENT DWELLING UNITS (EDU's)

| | EDUs/unit | Units Served By POTW | Total EDUs |
|---|---|---|---|
| **Single family residence** | 1.00 | 20,000 | 20,000 |
| **Apartments (1-2 bedrooms)** | .75 | 3,600 | 2,700 |
| **Apartments (3 or more bedrooms)** | 1.00 | 6,900 | 6,900 |
| **Retail stores** | .25 | 980 | 245 |
| **Taverns (15 chairs or seats)** | 1.00 | 100 | 100 |
| **Total EDUs** | | | 29,945 |

**TABLE 4** NORMAL DOMESTIC SANITARY SEWAGE LOADINGS (Based on Sampling Results of Residential Users)

| | BOD | SS |
|---|---|---|
| Influent Concentration (mg/L) | 275 | 275 |
| Conversion factor (wgt. - 1 gallon of water) | X 8.34 lbs | X 8.34 lbs |
| Influent Concentration in lbs/mg | 2,294 | 2,994 |
| Annual Volume - mg (table 2) | X 2,993 | X 2,993 |
| Normal Domestic Sanitary Sewage Loadings | 6,866,000 lbs | 6,866,000 lbs |

**TABLE 5** EXCESS AMOUNT OF BOD AND SS

| | BOD | SS |
|---|---|---|
| Annual Usage (Table 2) | 7,600,000 lbs | 8,000,000 lbs |
| Normal Loadings (Table 3) | 6,866,000 lbs | 6,866,000 lbs |
| Excess | 734,000 lbs | 1,134,000 lbs |

**TABLE 6** PERCENTAGE OF NORMAL LOADINGS (Table 4) to ACTUAL LOADINGS (Table 2)

| BOD | SS |
|---|---|
| 6,866,000 ÷ 7,600,000 = 90% | 6,866,000 ÷ 8,000,000 = 86% |

## FORMULA DEFINITIONS

Ba = Total annual pounds of BOD
Bb = Annual O,M&R surcharge for excess BOD
Bl = Excess pounds of BOD contributed annually by all users
Bp = Percentage of Normal Domestic BOD to Actual (Table 6)
Bt = Total annual O,M&R unit processing costs for BOD
Ca = Annual user charge rate
Cd = Annual user charge rate for normal domestic sanitary sewage
Ce = Annual user charge rate per equivalent dwelling unit
Ct = Total annual O,M&R costs
Cv = Total annual O,M&R unit processing costs for volume
Et = Total number of Equivalent dwelling units
Ob = User charge rate by unit process for BOD
Os = User charge rate by unit process for SS
Ov = User charge rate by unit process for volume
Sa = Total annual pounds of SS
Sb = Annual O,M&R surcharge for excess SS
Sl = Excess pounds of SS contributed annually by all users
Sp = Percentage of Normal Domestic SS to Actual (Table 6)
St = Total annual O,M&R unit processing costs for SS
Vt = Total annual volume

## VOLUME METHOD OF CALCULATING USER CHARGES

1. Calculation of Volume Rate based on measured flow:

Formula: $Ca = Ct/Vt$

Example: $Ca = \frac{\$1,647,000}{2,993\ mg}$ $\qquad Ca = \$550/mg$

2. Calculation of Volume Rate using Equivalent Dwelling Units:

Formula: $Ce = Ct/Et$

Example: $Ce = \frac{\$1,647,000}{29,945}$ (Table 3) $\qquad Ce = \$55/EDU$

## CALCULATIONS OF USER CHARGE RATES USING THE SURCHARGE METHOD

1. Determine user charge rate for treating normal domestic sanitary sewage.

Formula: $Cd = \frac{Cv + (Bt)\ Bp) + (St)\ (Sp)}{Vt}$

Example: $Cd = \frac{\$492,500 + (\$794,000)\ (90\%) + (\$360,500)\ (86\%)}{2,993\ mg}$

$Cd = \frac{\$1,519,200}{2,993\ mg}$

$Cd = \$508\ mg$

2. Calculation of surcharge rates (added to volume rate):

Formula:

**BOD**

$Bb = Bt/Ba$

**SS**

$Sb = St/Sa$

Example:

$Bb = \frac{\$794,000}{7,600,000\ lbs}$

$Bb = \$.11/lb$

$Sb = \frac{\$360,000}{8,000,000\ lbs}$

$Sb = \$.05/lb$

## QUALITY / QUANITY METHOD**

| Formula: | **Volume** | **BOD** | **SS** |
|---|---|---|---|
| | $Qv = Cv/vt$ | $Qb = Bt/Ba$ | $Qs = St/Sa$ |
| Example: | $Qv = \frac{\$492,500}{2,993\ mg}$ | $Qb = \frac{\$794,000}{7,600,000\ lbs}$ | $Qs = \frac{\$360,500}{8,000,000\ lbs}$ |
| | $Qv = \$165/mg$ | $Qb = \$.11/lb$ | $Qs = \$.05/lb$ |

**The quality/quantity method should not be used when there are less than normal strength discharges. Since weak wastes are more expensive to than normal domestic sewage (because the plant is designed to function within a specific range of concentrations), charging weak strength users rates based on normal domestic strength sanitary sewage will result in a shortfall.

## APPENDIX III

### MODEL USER CHARGE ORDINANCE
### ORDINANCE NO._____

An ordinance establishing user charges in the city (town, sewage district, etc.) to provide funds needed to pay for operation and maintenance expenses associated with the _____'s wastewater treatment works.

WHEREAS, the _____of _____, _____, has constructed wastewater treatment works; and

WHEREAS, it is the _____'s intent to establish proportionate user charges that places the costs of abatement directly on the sources of pollution, conserves potable water, and maintains financial self-sufficiency, and

WHEREAS, the _____must pay the operation and maintenance expenses associated with the said treatment works and charge the users of said treatment works accordingly:

NOW, THEREFORE, BE IT ORDAINED BY THE _____, of the _____ of _____, _____, that the following user charges are established.

#### ARTICLE I

It is determined and declared to be necessary and conducive to the protection of the public health, safety, welfare and convenience of the _____ _____ to collect charges from all users who contribute wastewater to the _____treatment works. The proceeds of such charges so derived will be used for the purpose of operating and maintaining the public wastewater treatment works.

#### ARTICLE II

Unless the context specifically indicates otherwise, the meaning of terms used in this ordinance shall be as follows:

**Section 1**: "BOD" (denoting Biochemical Oxygen Demand) shall mean the quantity of oxygen utilized in the biochemical oxidation or organic matter under standard laboratory procedure in five (5) days at 20°C, expressed in milligrams per liter (mg/l).

**Section 2**: "Normal Domestic Wastewater" shall mean wastewater that has a BOD concentration of not more than_____mg/ and a suspended solids concentration of not more than _____mg/1 (and any other pollutant, specify, concentration of not more than _____mg/1).

**Section 3**: "Operation and Maintenance" shall mean those functions that result in expenditutes during the useful life of the treatment works for materials, labor, utilities and other items which are necessary for managing and which such works were designed and constructed. The term "operation and maintenance" includes replacement as defined in section 4.

**Section 4**: "Replacement" shall mean expenditures for obtaining and installing equipment, accessories or appurtenances which are necessary during the useful life of the treatment works to maintain the capacity and performance for which such works were designed and constructed.

**Section 5**: "Residential User" shall mean any contributor to the city's treatment works whose lot, parcel or real estate, or building is used for domestic dwelling purposes only.

**Section 6**: "Commercial User" shall mean all retail stores, restaurants, office buildings, laundries, and other private business and service establishments.

**Section 7**: "Industrial User" shall include any non-governmental, non-residential user of publicly owned treatment works which is identified in the Standard Industrial Classification Manual, 1972, Office of Management and Budget, as amended and supplemented, under the following divisions; Division A-Agriculture, Forestry, and Fishing; Division B-Mining; Division D -Manufacturing; Division E-Transportation, Communications, Electric, Gas and Sanitary; and Division I -Services.

**Section 8**: "Institutional User" shall include social, charitable, religions, and educational activities such as schools, churches, hospitals, nursing homes, penal institutions and similar institutional users.

**Section 9**: "Governmental User" shall include legislative, judicial, administrative, and regulatory activities of Federal, State and local governments.

**Section 10**: "Shall" is mandatory; "May" is permissive.

**Section 11**: "SS" (denoting Suspended Solids) shall mean solids that either float on the surface of or are in suspension in water, sewage, or other liquids and which are removable by laboratory filtering.

**Section 12**: "Treatment Works" shall mean any devices and systems for the storage, treatment, recycling and reclamation of municipal sewage, domestic sewage or liquid industrial wastes. These include intercepting sewers, outfall sewers, sewage collection systems, pumping, power, and other equipment and their appurtenances; extensions improvement, remodeling, additions and alterations thereof; elements essential to provide a reliable recycled supply such as standby treatment units and clear well facilities; and any works, including site acquisition of the land that will be an integral part of the treatment process or is used for ultimate disposal of residues resulting from such treatment (including land for composting sludge, temporary storage of such compost and land used for the storage of treated wastewater in land treatment systems before land application); or any other method or system for preventing, abating, reducing, storing, treating, separating or disposing of municipal waste or industrial waste, including waste in combined storm water and sanitary sewer systems.

**Section 13**: "Useful Life" shall mean the estimated period during which a treatment works will be operated.

**Section 14**: "User Charge" shall mean that portion of the total wastewater service charge which is levied in a proportional and adequate manner for the cost of operation, maintenance and replacement of the wastewater treatment works.

**Section 15**: "Water Meter" shall mean a water volume measuring and recording device, furnished and/or installed by a user and approved by the _____ _____.

## ARTICLE III

**Section 1**: The revenues collected, as a result of the user charges levied, shall be deposited in a separate non-lapsing fund know as the *Operation, Maintenance and Replacement Fund.*

**Section 2**: Fiscal year-end balances in the operation, maintenance, and replacement fund shall be used for no other purposes than those designated. Monies which have been transferred from other sources to meet temporary shortages in the operation, maintenance and replacement fund shall be returned to their respective accounts upon appropriate adjustment of the user charge rates for operation, maintenance and replacement. The user charge rate(s) shall be adjusted such that the transferred monies will be returned to their respective accounts within six months of the fiscal year in which the monies were borrowed.

## ARTICLE IV

(Rates and Charges Based on the Surcharge Method)

NOTE: Presented below is an example of a Rates and Charges Section of a user charge ordinance. The example presented is for illustrative purposes only. Since each local ordinance must be tailored to reflect unique local conditions. The methodology used to construct this section may well vary from the example presented.

**Section 1**: Each user shall pay for the services provided by the _____based on his use of the treatment works as determined by water meter readings (or other appropriate methods) acceptable to the _____.

**Section 2**: For residential, industrial, institutional and commercial users, *monthly* user charges will be based on actual water usage. If a residential, commercial, institutional, or industrial user has a consumptive use of water, or, in some other manner, uses water which is not discharged into the wastewater collection system, the user charge for that contributor may be based on readings of a wastewater meter(s) or separate water meter(s) installed and maintained at the user's expense.

**Section: 3** (Reference is made to Appendix III-A of this ordinance).

Each user shall pay a user charge rate for operation and maintenance including replacement of $_____per 1000 gallons of water.

**Section 4**: (Reference is made to Appendix III-A of this ordinance).

For those users whose wastewater has a greater strength than normal domestic sewage, a surcharge in addition to the normal user charge, will be collected. The surcharge for operation and maintenance including replacement is:

$ _____per pound BOD
$ _____per pound SS
$ _____per pound Other Pollutant(s) (Specify)

**Section 5**: Any user which discharges any toxic pollutants (as defined in the Sewer Use Ordinance) which cause an increase in the cost of managing the effluent of the sludge from the _____'s treatment works, or any user which discharges any substance which singly or by interaction with other substances causes identifiable increases in the cost of operation, maintenance or replacement of the treatment works, shall pay for such increased costs. The charge to each such user shall be as determined by the appropriate financial personnel and approved by the _____.

**Section 6**: The user charge rates established in this article apply to all users of the _____'s treatment works.

## ARTICLE V

(Note: Late payment criteria and penalties are outlined in Article V. The criteria and penalties shown are for illustrative purposes only. The wastewater utility may use whatever criteria and penalties it deems appropriate.)

**Section 1**: All users shall be billed *monthly*. Billings for any particular *month* shall be made within *ten days* after the end of the *month*. Payments are due within *twenty days* after the end of the month. Any payment not received within *thirty days* after the end of the month shall be delinquent.

**Section 2**: A late payment penalty of *1 percent* of the user charge bill will be added to each delinquent bill for each *thirty days* or portion thereof of delinquency. When any bill *is more than ninety days* in default, water and/or sewer service to such premise shall be discontinued until such bill is paid.

**Section 3**: When any bill (including interest and penalty) remains unpaid for one year after the date due, such bill shall be recorded in the land records of _____by the *treasurer* and shall constitute a lien on the property. If such lien (including interest and penalty) remains unpaid for a period of one year after date of recordation, such property shall be subject to public sale by the *treasurer*.

## ARTICLE VI

All users contributing more than _____gallons per month and whose waste strength is greater than _____mg BOD/1 or _____mg SS/1 shall prepare and file with the _____a report that shall include pertinent data relating to the wastewater characteristics, including the methods of sampling and measurment to obtain these data, and these data shsll be used to calculate the user charge for that user. The _____ shall have the right to gain access to the waste stream and take its own samples. Should the _____do so and should the results be substantially different as determined by _____from the data submitted by the user, the user charge for that user shall be revised for the next billing cycle/period.

## ARTICLE VII

**Section 1**: Any user who feels his user charge is unjust and inequitable may make written application to the _____requesting a review of his user charge. Said written request shall, where necessary, show the actual or estimated average flow and/or strength of his wastewater in comparison with the values upon which the charge is based, including how the measurements or estimates were made.

**Section 2**: Review of the request shall be made by the _____and if substantiated, the user charges for that user shall be recomputed based on the revised flow and/or strength data and the new charges shall be applicable to the next billing cycle/period.

## ARTICLE VIII

**Section 1**: The _____will review the user charges at least annually and revise the rates as necessary to ensure that adequate revenues are generated to pay the costs of operation and maintenance including replacement and that the system continues to provide for the proportional distribution of operation and maintenance including replacement costs among users and user classes.

**Section 2**: The _____will notify each user at least annually of the rate being charged for operation, maintenance including replacement of the treatment works.

## ARTICLE IX

Passed by the _____of the_____of _____,
_____ this _____ day of _____, 19____.

_____

ATTEST:

_____

Clerk

Approved this _____ day of _____, 19____.

ATTEST:

_____

Clerk

## APPENDIX III—A TO USER CHARGE ORDINANCE

(Actual Use Rate Structure)

This appendix presents the methodology to be used in calculating user charge rates and surcharges and illustrates the calculations followed in arriving at the first year's user charges and surcharges.

1. Expenses: Total Annual Expenses By Unit Process Are:

| Unit Process (SPECIFY) | Total Annual Costs | Volume Amount | BOD Amount | SS Amount | Other (Specify) Amount |
|---|---|---|---|---|---|
| _____ | | | | | |
| _____ | | | | | |
| _____ | | | | | |
| _____ | | | | | |
| Allocation of general costs | | | | | |
| Allocation of equipment replacement reserves | | | | | |
| Total OM&R costs | | | | | |

2. Loadings:

The total water consumption is estimated to be _____ gal/year.

The BOD loading is estimated to be _____ pounds/year.

The SS loading is estimated to be _____ pounds/year.

The _____ (SPECIFY) loading is estimated to be _____ pounds/year.

3. Unit Costs:

$$\text{Total annual OM\&R costs in \$/1,000 gallons} = \frac{\text{Total annual OM\&R \$}}{\text{Estimated annual water consumption/1,000 gallons.}}$$

$$\text{Unit cost for BOD in \$/pound} = \frac{\text{Annual \$ to treat annual SS}}{\text{Estimated annual BOD loading}}$$

$$\text{Unit cost for SS in \$/pound} = \frac{\text{Annual \$ to treat annual SS}}{\text{Estimated annual SS loading}}$$

$$\text{Unit cost for other pollutants} = \frac{\text{Annual \$ to treat other annual pollutants}}{\text{Estimated annual other pollutant loading}}$$

The costs for total OM&R, BOD, SS and Other Pollutants are to be inserted in Article IV, Section 3 and 4 of the ordinance.

# DEFINITIONS

The following terms shall be defined as:

**Assessment:** (1) The process of making the official valuation of property for purposes of taxation. (2) The valuation placed property as a result of this process. (3) The charge against any particular parcel of land within the boundaries of an irrigation, water, sewer, drainage, or other district created for the purpose of constructing improvements, or a share of the total cost of such improvement, usually based on the proportionate benefits received by such parcel as a result of the improvement.

**Assessments, special**: A direct tax levy assessed against property to pay for property improvements that ordinarily are a direct benefit to the property itself.

**Assets**: Any real property and property rights that are of value to and owned by the enterprise (utility).

**Capital**: Property of a permanent nature or intended for long continued use or possession, employed in or necessary for the conduct of an undertaking, and representing the investment of money or its equivalent. Examples include trucks, meters, pumps, and motors.

**Fixed**: Permanent property, such as land, buildings, sewer collection pipelines, tanks, rights and benefits (tangible and intangible), permanently employed in the rendering of a service or in the production of a product.

**Intangible**: Any element of value applied to permanent property of a non-physical nature such as a franchise, trademark, patent, copyright, good will, cost of organizing, developing, and establishing; also, such items as going value, right of access, water right, and power right.

**Physical**: See assets, tangible.

**Tangible**: Permanent property of a physical nature such as lands, buildings, mineral deposits, wells, reservoirs, plant equipment of all kinds, utensils, furnishings, merchandise intended for immediate use and permanent improvements.

**Authority**: A government of public agency created to perform a single function or a restricted group of related activities. Usually such units are financed from service charges, fees, and tolls, but in some instances they also have taxing powers. An authority may be completely independent of other governments for its creation, its financing, or the exercise of certain powers.

**Betterment**: An addition made to, or change made in, a fixed or capital asset which is expected to prolong its life, expand its capacity, or increase its efficiency beyond initial design parameters and over and above that arising from maintenance, and the cost of which is therefore added to the book value of the asset. The term is sometimes applied to sidewalks, sewers, and highways, but it is preferable to designate these as "improvements." See also improvements.

**Biochemical oxygen demand (BOD)**: The quantity of oxygen utilized in the biochemical oxidation of organic matter in a specified time and at a specified temperature, usually at 5 days and 20°C.

**Capital Costs**: Costs of major rehabilitation, betterments, expansion or upgrading required as facilities reach the end of their useful life.

**Capital Outlays**: Expenditures which result in the acquisition of or addition to fixed assets.

**Collection System**: The sewer lines and appurtenances used and useful in the collection and conveyance of wastewater. See also wastewater system.

**Commercial User**: All retail stores, restaurants, office buildings, laundries, and other private business and service establishments.

**Enterprise Fund**: A fund established to account for operations (a) that are financed and operated in a manner similar to private business enterprises where the intent of the governing body is that the costs (expenses, including depreciation) of providing goods or services to the general public on a continuing basis be financed or recovered primarily through user charges; or (b) where the governing body has decided that periodic determination of revenues earned, expenses incurred, and/jor net income is appropriate for capital maintenance, public policy, management control, accountability, or other purposes. Examples of Enterprise Funds are those for water, gas, and electric utilities; swimming pools; airports; parking garages; and transit systems.

**Governmental**: Shall include legislative, judicial, administrative, and regulatory activities of Federal, State, and local governments.

**Grantee**: A municipality that has executed a Federal grant agreement.

**Improvements**: Buildings, other structures, and other attachments or annexations to land which are intended to remain so attached or annexed, such as sidewalks, trees, drives, tunnels, drains, and sewers. Sidewalks, curbing, sewers, and highways are sometimes referred to as "betterments," but the term "improvements" is preferred.

**Industrial User**: Any nongovernmental, nonresidential user of publicly owned treatment works which is identified in the Standare Industrial Classification Manual, 1972, Office of Management and Budget, as amended and supplemented, under the following divisions: Division A – Agriculture, Forestry, and Fishing; Division B – Mining; Division D – Manufacturing; Division E – Transportation, Communications, Electric, Gas, and Sanitary; and Division I – Services.

**Inflitration**: Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow.

**Inflow**: Water other than wastewater that enters a sewer system (including sewer service connections) from sources such as, but not limited to, roof leaders, cellar drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch gasins, cooling towers, storm waters, surfasce runoff, street wash waters, or drainage. Inflow does not include, and is distinguished from infiltration.

**Institutional**: Shall include social, charitable, religious, and educational activities such as schools, churches, hospitals, nursing homes, penal institutions and similar institutional users.

**Operation and Maintenance**: Those functions that result in expenditures during the useful life of the treatment works for materials, labor, utilities, and other items which are necessary for managing and maintaining the sewage works to achieve the capacity and performance for which such works were designed and constructed.

**Rate Base**: The value of utility property used in computing an authorized rate of return as authorized by law or a regulatory commission.

**Replacement**: Expenditures for obtaining and installing equipment, accessories, or appurtenances which are necessary during the useful life of the treatment works tomaintain the capacity and performance for which such works were designed and contrructed. The term "operation and maintenance" (O&M) includes replacement.

**Replacement Costs**: The cost as of a certain date of a property which can reder similar service (but which need not be of the same structural form) as the property to be replaced. Replacement is an incremental element of operating costs and is variable depending upon levels of expenditures for maintenance. The statutory definition of the term means expenditures for obtaining and installing equipment, accessories or appurtences during the useful life of the treatment works necessary to maintain the capacity and performance for which they were designed and constructed. It is not a capital cost and does not increase the book value of an asset.

**Residential**: Shall include all dwelling units such as detached, semi-detached, row-houses, mobile homes and multi-family dwellings.

**Service Charge**: A charge levied on a user of the treatment works which includes a user charge, a charge for capital reserve and debt service, other charges for current services, or all of these.

**Suspended solids**: Solids that either float on the surface of or are in suspension in water, wastewater, or other liquids and that are removable by a standard laboratory filtering procedure.

**User**: A recipient of wastewater treatment services.

**User Charge**: A charge levied on users of a treatment works for the cost of operation and maintenance, including replacement.

**Wastewater System**: (wastewater facility) A collective term used to denote all the property involved in the operation of a wastewater treatment utility. It includes land, sewer lines and appurtenances, pumping stations, treatment plants, and general property. See also wastewater utility. Synonym: Sewer System.

**Wastewater Utility**: An enterprise, the principal objective of which is the rendering of wastewater service.